SOUTH LAKE WELLFIELD AND ASSOCIATED INFRASTRUCTURE

(Water Supply Options project number 1)

DESCRIPTION OF PROJECT

The South Lake Wellfield project is a collaborative effort between the members of the South Lake Regional Water Initiative (SLRWI) which includes Lake County government, the communities of Clermont, Mascotte, Groveland, Minneola and Montverde and Lake Utility Services, Inc (LUSI). These entities have already entered into an interlocal agreement setting forth the structure for cooperatively bringing a water supply project forward.

In general, the project entails the development of a Lower Florida aquifer wellfield or series of wellfields located in south Lake County south of the City of Clermont. The water from the Lower Floridan in this area could be brackish or potable in nature. Either way, the SLRWI members will be able to make use of the wellfield output. The project includes the construction of a new wellfield(s), a brackish groundwater treatment facility, a concentrate disposal well, a water storage tank, a transmission pump station and transmission mains to facilitate water wheeling among the SLRWI partners. Internal infrastructure upgrades by each participating utility to address distribution and water quality concerns will also be completed but are not included in this project.

The SLRWI members recently issued a Request for Proposals document to secure the services of an engineering firm to further evaluate this option. This study will help to finalize quantities of water required by each entity, perform further groundwater modeling including lowering existing wells to the Lower Floridan to compliment the South Lake Wellfield project and recommend water wheeling alternatives between SLRWI members. Results of the study, expected by mid to late 2015, are expected to identify the best strategy and combination of projects to reduce MFL impacts while yielding sufficient water to satisfy future area demands.

PLANNING LEVEL DESIGN OF PROJECT

Components of the project include the following: four production wells, a brackish groundwater treatment facility, a concentrate disposal well, a water storage tank, a transmission pump station and transmission main construction to partner utilities.

LOWER FLORIDAN WELLFIELD

It is anticipated that the entities will meet the 2015 demand of 18.26 million gallons per day (mgd) through their existing wells. The projected 2035 demand for the SLRWI entities is estimated at 30.99 mgd (Table 1) which is 12.73 mgd above the 2015 demand. The additional 12.73 mgd will come from the proposed South Lake Wellfield. The number and placement of wells will be determined by the outcome of exploratory testing of the Lower Floridan and the modeling effort. The size and depth of wells will also depend on the findings of the exploratory testing. For the purposes of preliminary cost estimating, it is assumed that 4 wells, 16 inches in diameter will be installed to a depth of 1,600 feet. (based on 3.125 mgd per 16" well) Table 1. SLRWI public supply water demand in million gallons per day (Draft RWSP).

Table 1. RWSP demand projections for the SLRWI entities.

Utility	Demand Projections					
	2010	2015	2020	2025	2030	2035
Lake Utility Services Inc. (CUP 2700)	7.47	8.92	11.22	13.70	15.66	16.94
City of Clermont (CUP 2478)	4.47	5.26	6.04	6.50	6.78	7.01
City of Groveland (CUP 2796, 2913)	0.97	1.36	1.78	2.16	2.52	2.86
City of Minneola (CUP 2886)	1.48	1.62	1.80	2.00	2.21	2.46
City of Mascotte (CUP 2453)	0.53	0.60	0.69	0.79	0.89	0.99
Town of Montverde (CUP 2671)	0.43	0.50	0.60	0.66	0.69	0.73
	15.35	18.26	22.13	25.81	28.75	30.99

WATER TREATMENT PLANT

Lower Floridan aquifer water quality in the South Lake area is highly variable, ranging from potable quality north of SR 50 to slightly brackish further south. As a worst case scenario, the project includes construction of a treatment facility for removing TDS from the raw water. The likely treatment technology will be some type of membrane system resulting in the creation of, and need to dispose, a concentrate side stream. A deep injection well is included in the project components for concentrate disposal. Water testing of the proposed wellfield area will be necessary to confirm water quality. If brackish water is encountered, the SLRWI partners will review treatment options available at that time.

RAW WATER TRANSMISSION MAINS

It is anticipated that the transmission mains from the South Lake Wellfield will utilize public rights of way for routing. The primary transmission routes will be the US 27, Hartwood Marsh Road and Hancock Road rights of way to the City of Clermont Water Treatment Plant. From there, water will be stored and wheeled to the other members. At the halfway point between the wellfield and Clermont facility, approximately 63 percent of

the flow will be diverted for use in the South Sector/Wellness Way plan area served predominantly by LUSI. Proposed pipe size, lengths and flow quantities are given below:

From/To	Length (mile)	length (ft)	flow (mgd)	diameter (in)
well/LUSI	6.75	35,640	12.73	30
LUSI/WW	2	10,560	8.02	20
LUSI/Clerm.	6.75	35,640	4.71	16
Cler/Grove	8.78	46,358	1.89	10
Grove/Masc	4.5	23,760	0.39	6
Cler/Minn	5.45	28,776	0.84	8

It should be noted that a transmission main to the Town of Montverde is not envisioned at this time as it does not appear to be cost effective to extend a main from Clermont to Montverde. Montverde's ultimate demand is relatively small and will likely be satisfied with local sources.

ESTIMATED PLANNING-LEVEL COSTS

The planning level cost estimate for the South Lake Wellfield was developed utilizing the CFWI cost estimating tool. The project components contained within the cost estimates given below include the four Lower Floridan aquifer wells, a brackish groundwater treatment facility, a concentrate disposal well, a water storage tank, a transmission pump station, and the transmission piping described in the "Planning Level Design of Project" section above.

Planning Level Cost Estimate:	
Construction Costs	$98,486,073
Non-construction costs	$19,697,215
Land Costs	unknown
Total Capital Costs	$118,183,287
Equivalent Annual Costs (over 30 yrs)	$6,144,432/yr
Operation and Maintenance	$5,982,269/yr
Total Annual Costs	$12,126,701/yr
Unit Cost of Production	$3.38/1,000 gal

COST BENEFIT ANALYSIS OF YIELD

The proposed project is likely the most cost effective approach to providing non-traditional water supplies to the SLRWI member communities. Because of their geographic location in the center of the state, the SLRWI communities have few opportunities to take advantage of other traditional or alternative water sources. The group's proximity to the water resource constraints along the Lake Wales Ridge reduces the amount of traditional water withdrawals available from the Upper Floridan aquifer. There are no surface water sources sufficiently large and within a reasonable distance to supply the projected needs.

The closest surface water source with sufficient capacity to meet the projected needs is the St. Johns River at Yankee Lake. This source is approximately 41 miles from the center of the SLRWI service area. The next closest surface water source is the St. Johns River at Taylor Creek, which is approximately 50 miles distant. Both sources will require membrane level treatment similar to what is anticipated for the Lower Floridan wellfield project. Although the cost of a Lower Floridan wellfield could be eliminated, there would be a significant increase in transmission costs to convey the water to the SLRWI communities. Unless another source with sufficient capacity is identified through the CFWI process, the Lower Floridan project will provide the best cost to yield ratio.

ESTIMATED IMPLEMENTATION SCHEDULE

Project implementation is on the following schedule (dates are in calendar years):

- Planning study to determine ultimate demand, appropriate local source utilization strategy and characterization of a Lower Floridan wellfield needed to meet future demands: 2015
- Complete South Lake Wellfield investigation and recommend wellfield location and configuration: 2016
- Acquire wellfield property: 2017
- Wellfield, treatment and transmission main design: 2017-2018
- Production well construction: 2019
- Treatment facility construction: 2019 - 2022
- Water main construction: 2019-2021

WATER RESOURCE CONSTRAINTS

The CFWI modeling shows MFL impacts to several lakes in South Lake County for 2035 demand condition when proceeding with traditional groundwater sources. The Apshawa lakes are shown being impacted in 2015/850 mgd of total water use. For future demands satisfied by the South Lake Wellfield, CFWI modeling of the wellfield project shows MFL

impacts at four water bodies. North and South Lake Apshawa has 0.3 feet of impact in the Upper Floridan aquifer below the lakes, and Starbuck and Wekiwa springs have 0.1 and 0.2 cubic feet per second (cfs) impact, respectively. The model also predicts non-MFL impacts in one area of Seminole County. Although the model does show impacts, producing water from the Lower Floridan should minimize the potential for impacts when compared to traditional Upper Floridan sources.

At a minimum, the following water bodies would need to be considered during project design and permitting: Boggy Marsh, Cherry Lake, Lake Emma, Lake Louisa, Lake Lucy, Lake Minneola, North Lake Apshawa, Pine Island Lake, South Lake Apshawa, Rock Springs, Starbuck Springs, Wekiwa Springs.

PROJECT FEASIBILITY

The planned components of the South Lake Wellfield project are neither complex nor difficult to construct. What is lacking at this point is the identification of a wellfield location that can yield a sufficient quantity of water to satisfy the SLRWI group's demands without violating MFLs or detrimentally impacting wetlands.

POTENTIAL PARTNERS AND GOVERNANCE OPTIONS

Current members of the SLRWI and Phase 1 planning study funders through the interlocal agreement include:

- Lake County government
- City of Clermont
- City of Groveland
- City of Mascotte
- City of Minneola
- Town of Montverde
- LUSI

It is anticipated that participation in construction will be proportional to the quantity of water received by each entity. An amendment to the existing interlocal agreement will establish the roles and relationships of the parties participating in the project construction. It is anticipated that one of the participating entities will serve as the project lead with the remaining entities contributing their proportional cost share to the lead.

FUNDING SOURCES

The SLRWI received a $300,000 grant approved in the FY 2014/2015 state budget to fund the planning study.

Potential funding sources for construction include state grants, impact fees, revenue bonds and state revolving fund loans.